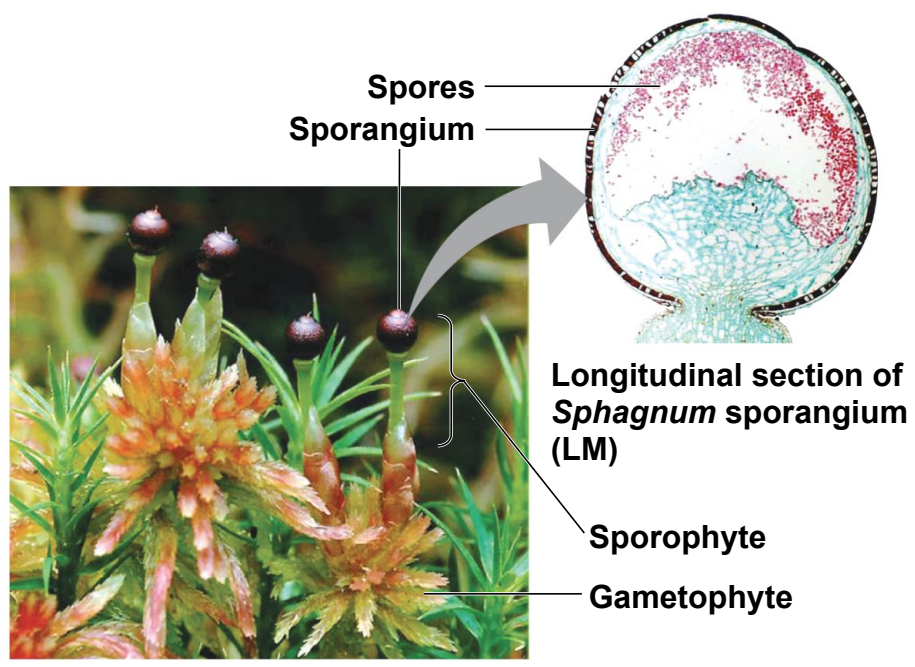
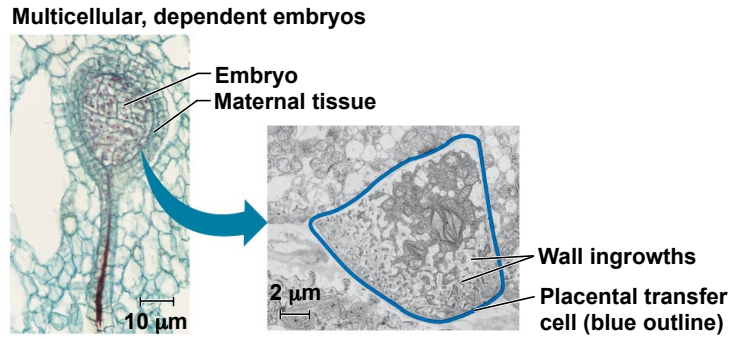
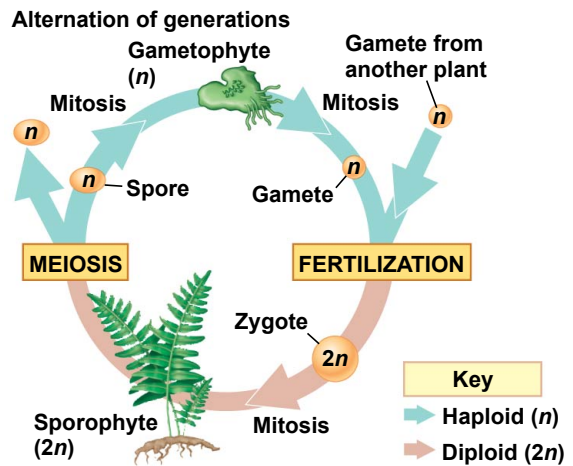
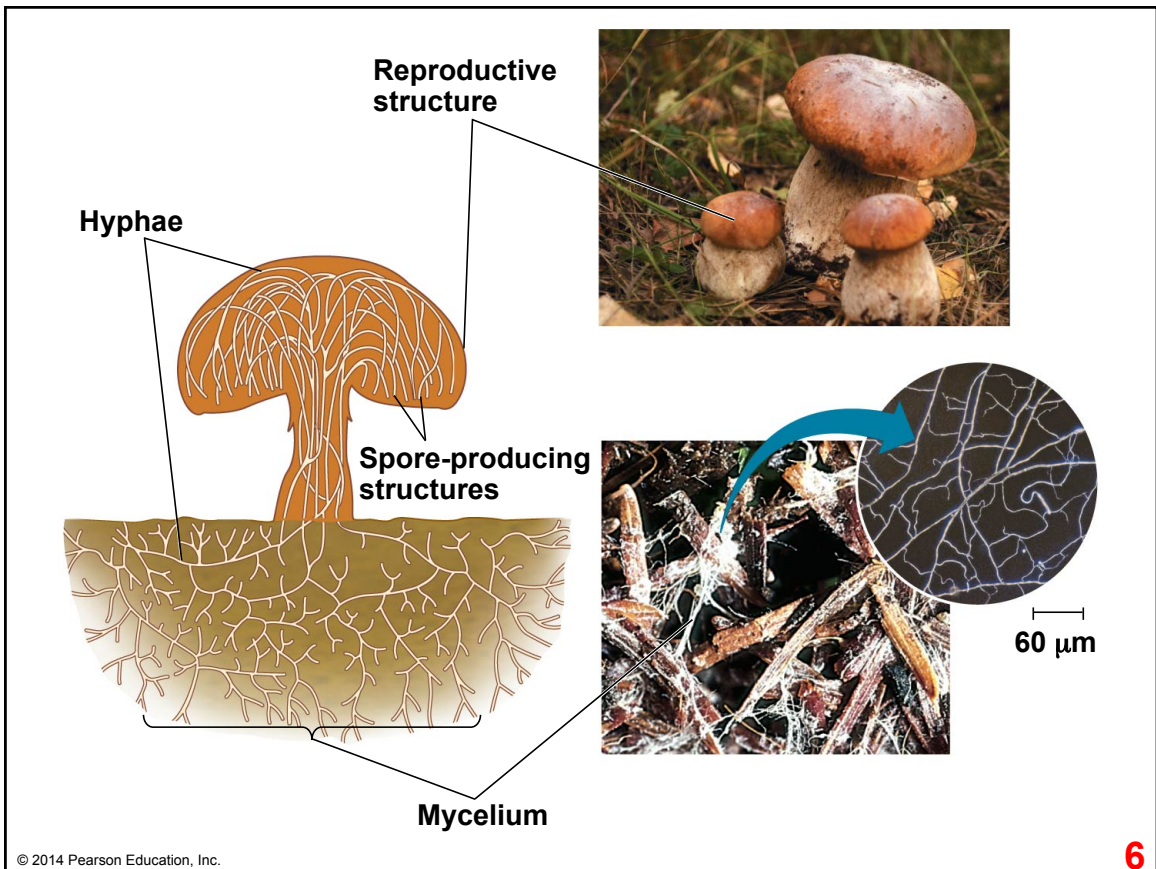
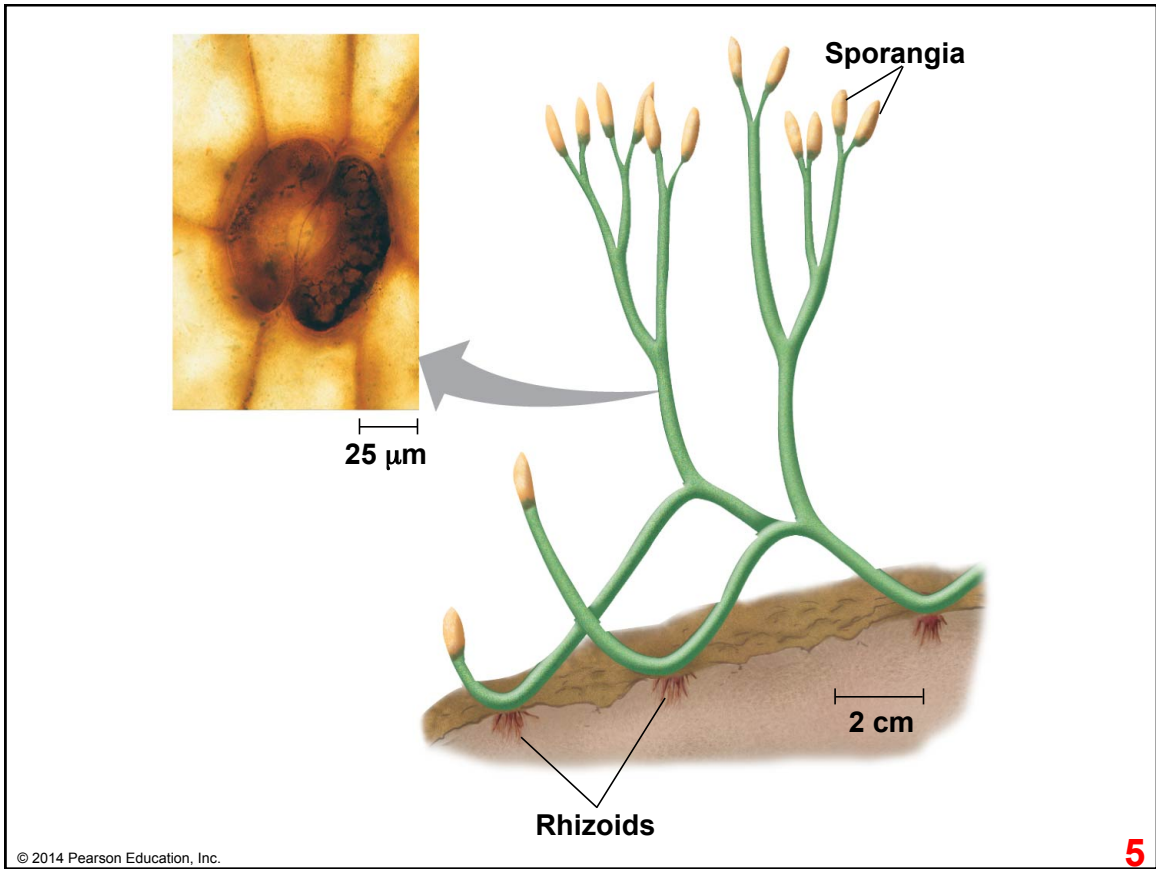
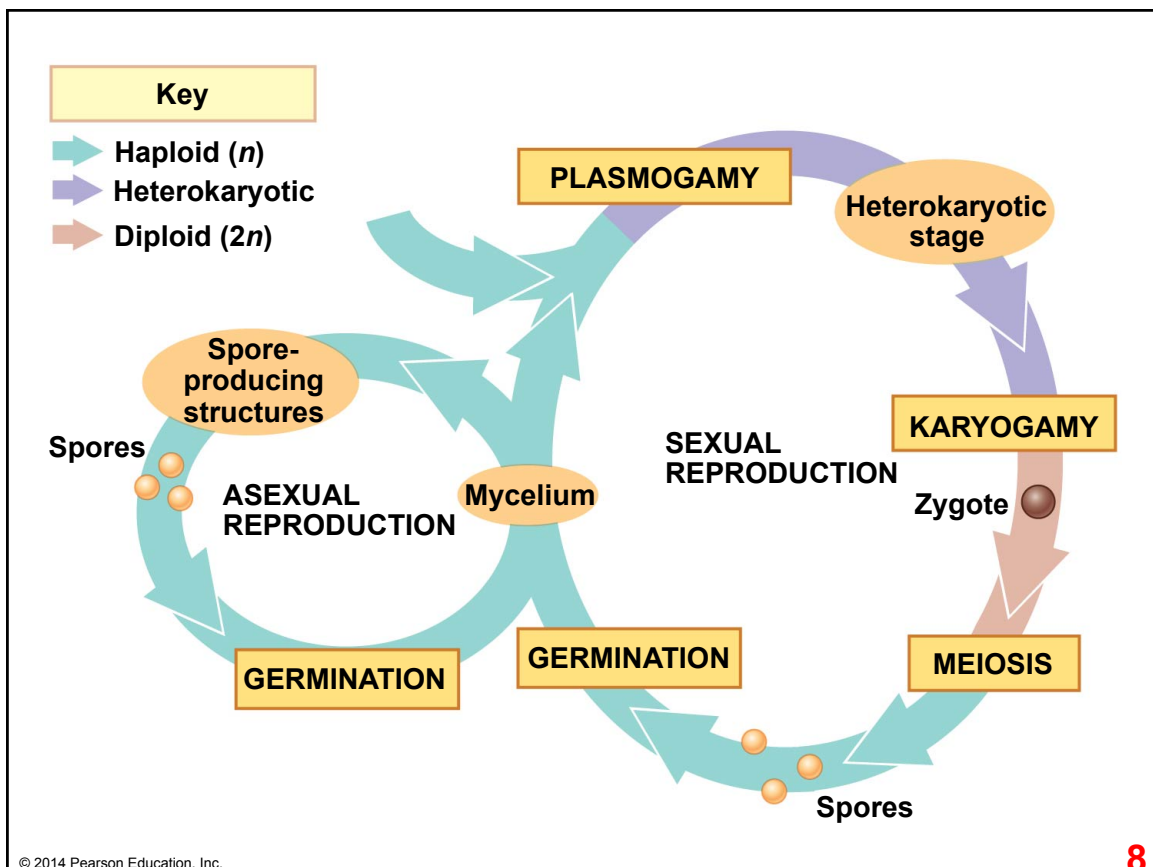
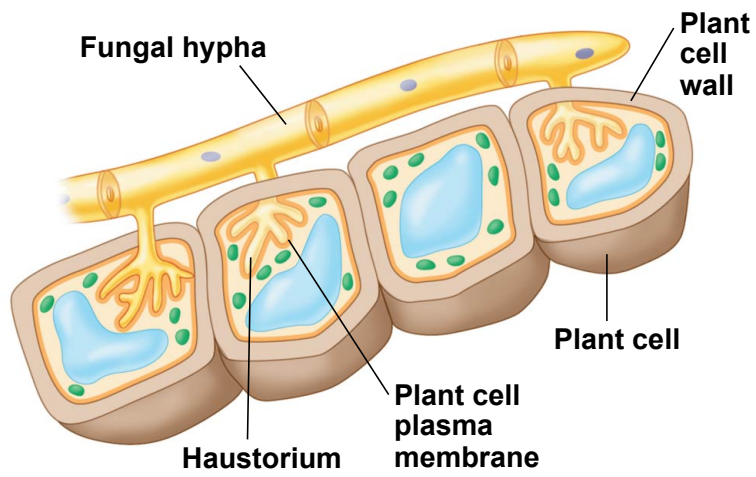
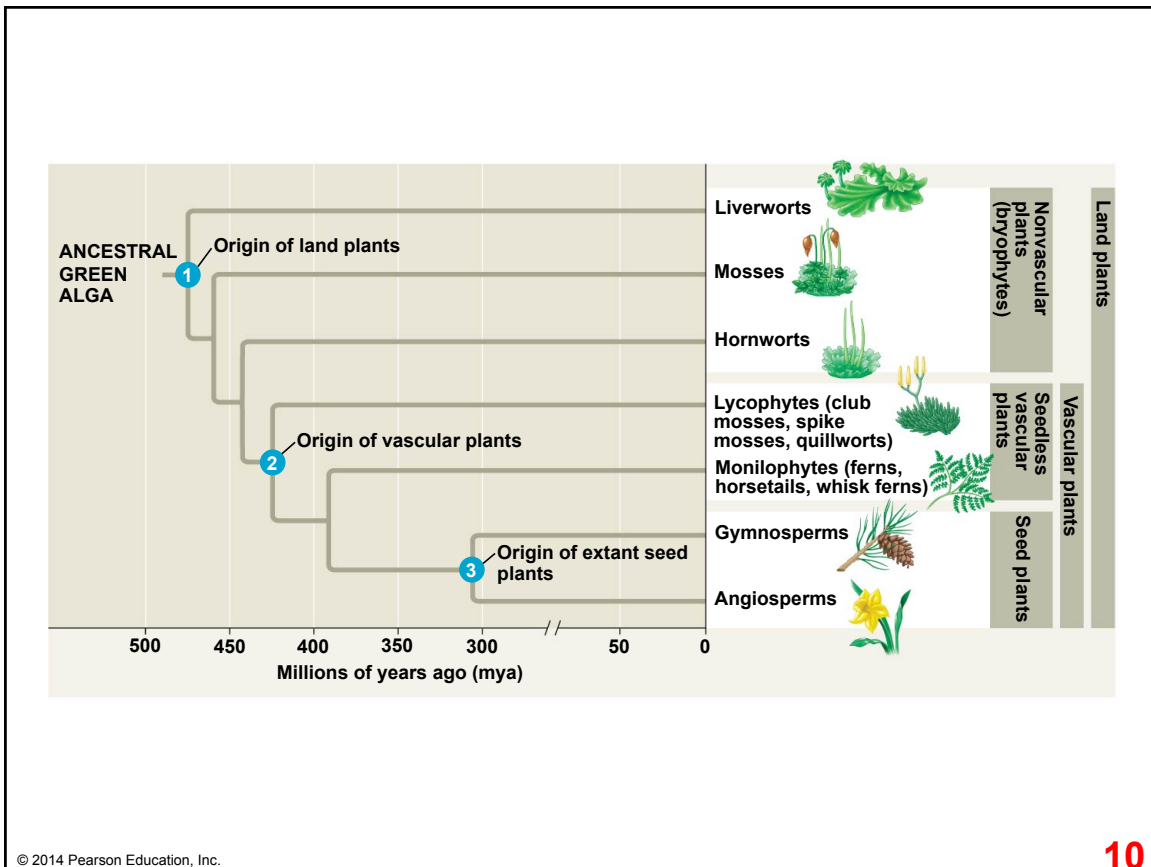
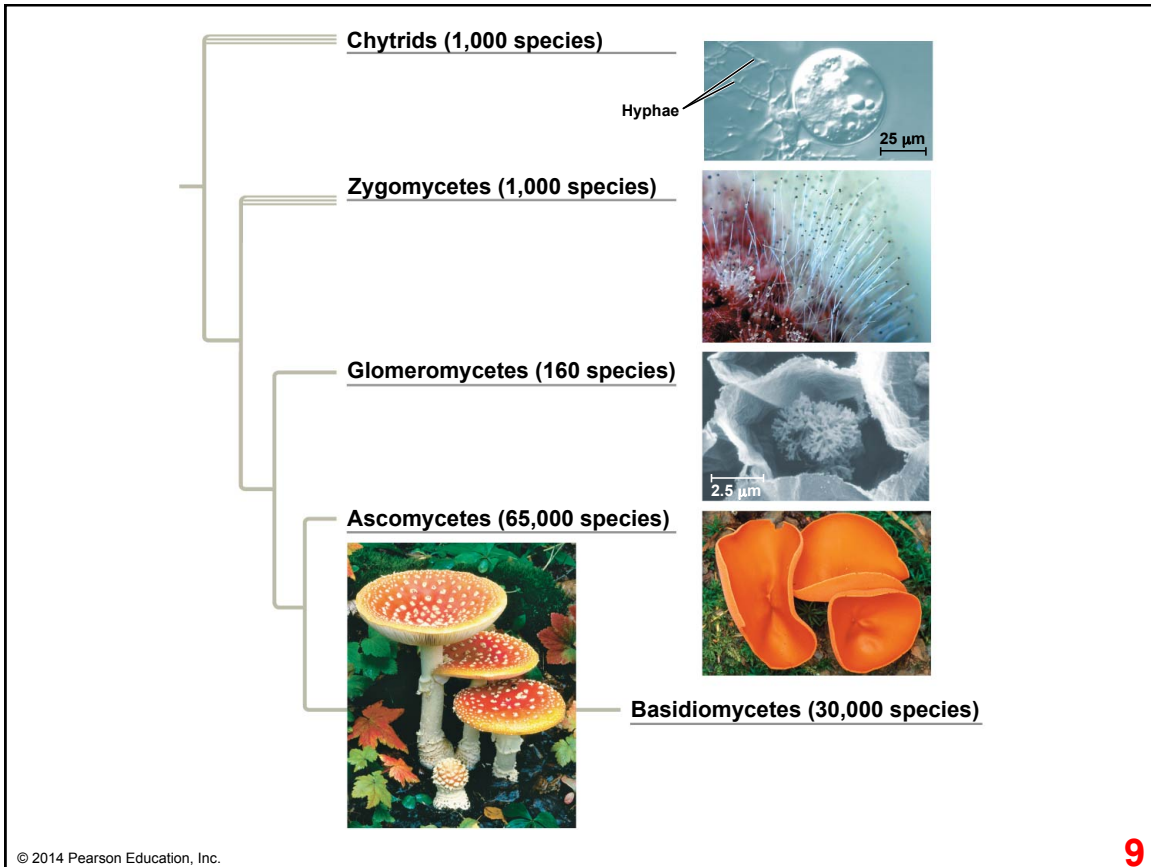


30 nm













(a) *Plagiochila deltoidea*, a liverwort



Sporophyte

Gametophyte

(c) *Anthoceros* sp., a hornwort



Capsule

Seta

Gametophyte

Sporophyte  
(a sturdy plant that takes months to grow)

(b) *Polytrichum commune*, a moss



Strobili  
(conelike structures in which spores are produced)

2.5 cm

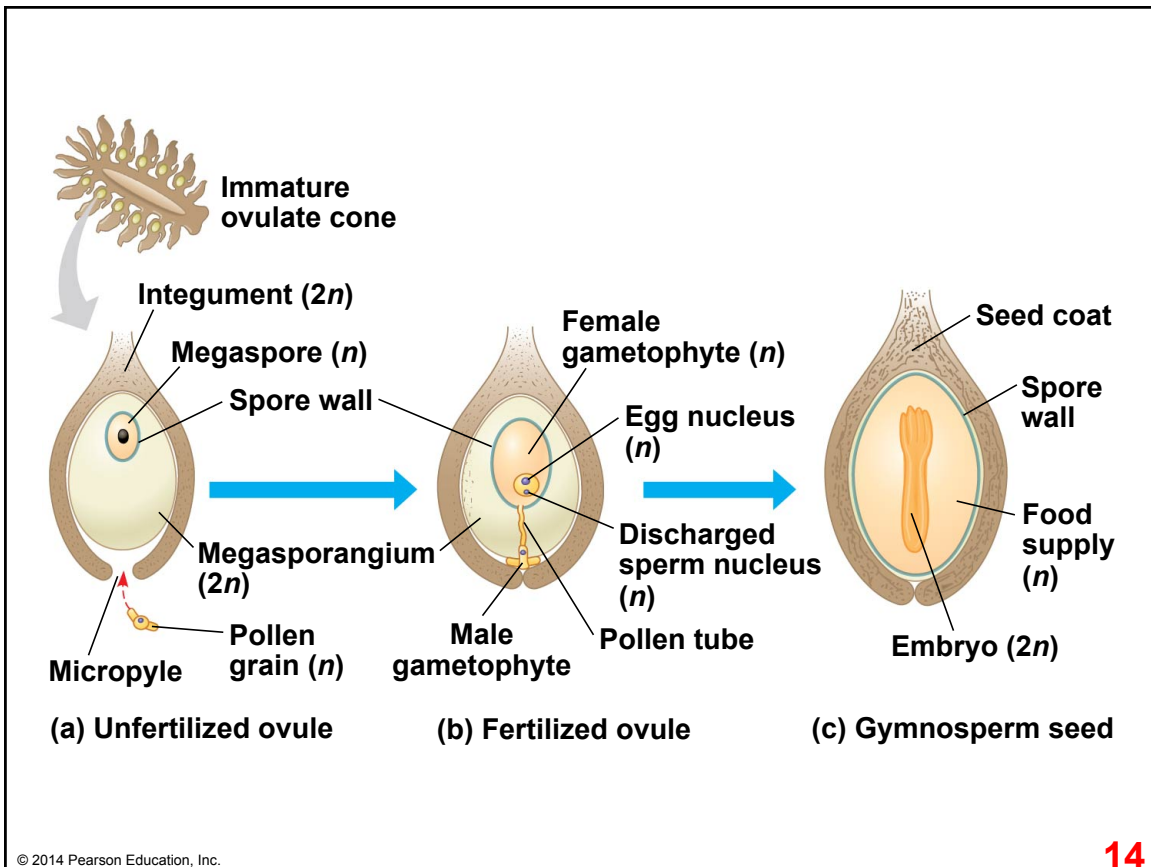
(a) *Diphasiastrum tristachyum*, a lycophyte



2.5 cm

(b) *Athyrium filix-femina*, a monilophyte

	PLANT GROUP		
	Mosses and other nonvascular plants	Ferns and other seedless vascular plants	Seed plants (gymnosperms and angiosperms)
Gametophyte	Dominant	Reduced, independent (photosynthetic and free-living)	Reduced (usually microscopic), dependent on surrounding sporophyte tissue for nutrition
Sporophyte	Reduced, dependent on gametophyte for nutrition	Dominant	Dominant
Example	<p>Sporophyte (2n) Gametophyte (n)</p>	<p>Sporophyte (2n) Gametophyte (n)</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>Gymnosperm</b></p> <p>Microscopic female gametophytes (n) inside ovulate cone Microscopic male gametophytes (n) inside pollen cone Sporophyte (2n)</p> </div> <div style="text-align: center;"> <p><b>Angiosperm</b></p> <p>Microscopic female gametophytes (n) inside these parts of flowers Microscopic male gametophytes (n) inside these parts of flowers Sporophyte (2n)</p> </div> </div>





(a) Sago palm (*Cycas revoluta*)



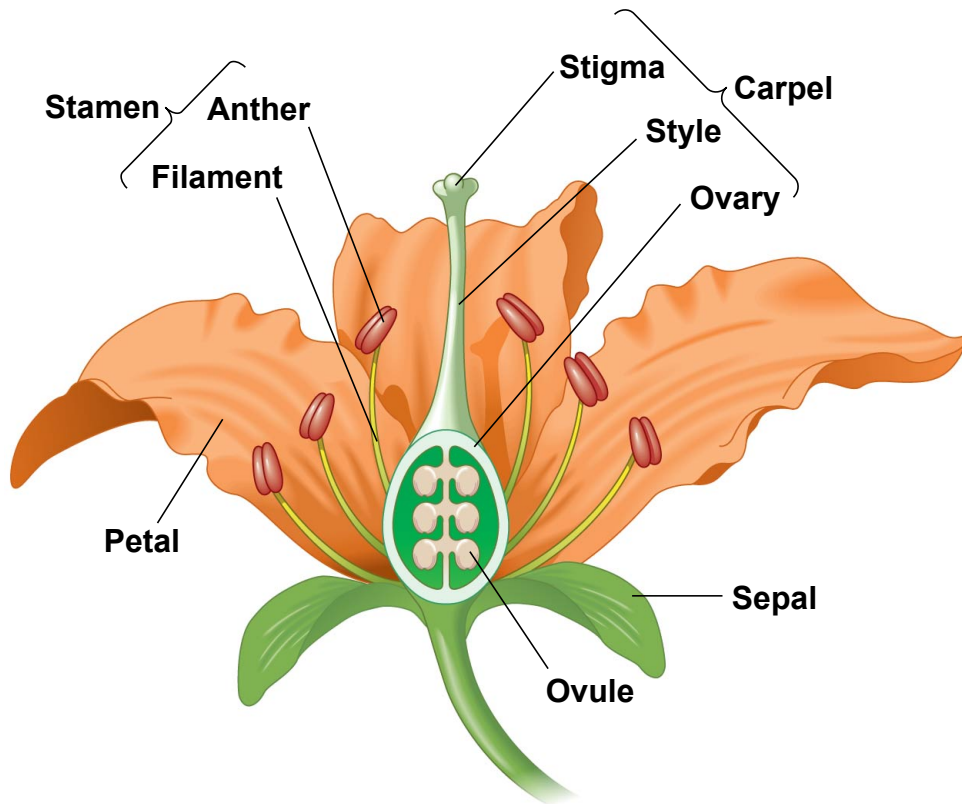
(b) Douglas fir (*Pseudotsuga menziesii*)



(c) Creeping juniper (*Juniperus horizontalis*)

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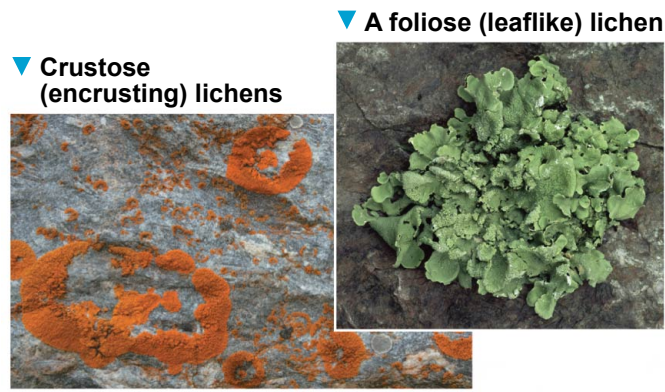
15



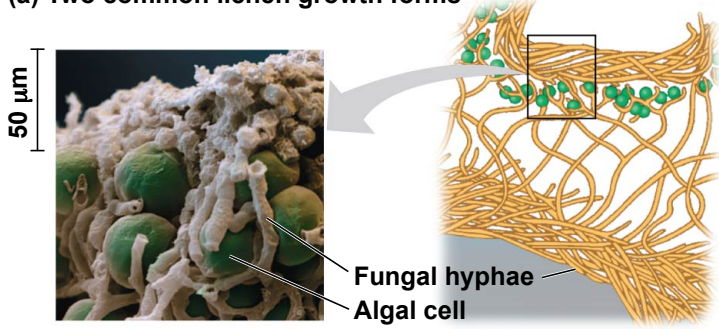
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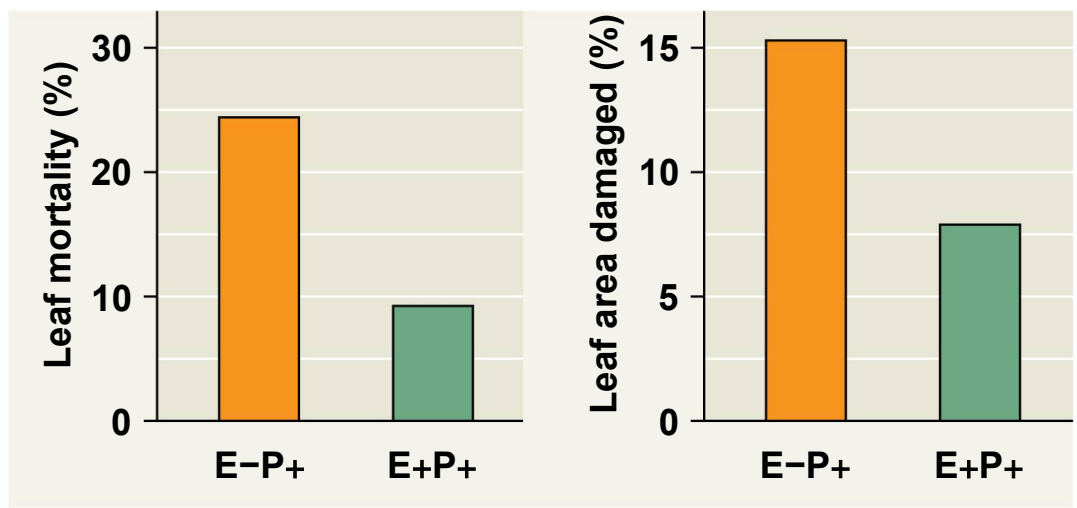
(a) Two common lichen growth forms



(b) Anatomy of a lichen involving an ascomycete fungus and an alga

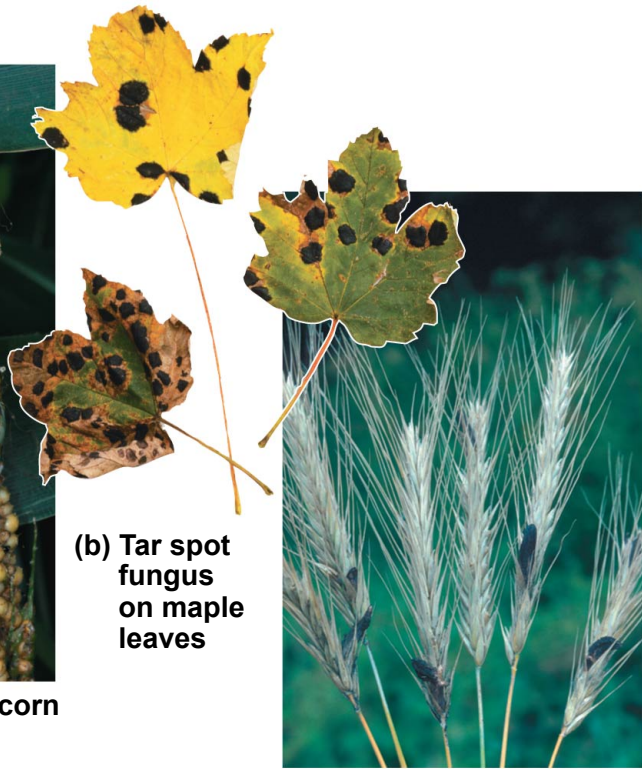
**Results**

- Endophyte not present; pathogen present (E-P+)
- Both endophyte and pathogen present (E+P+)





(a) Corn smut on corn

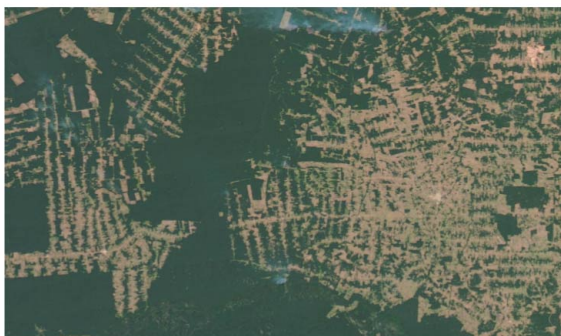


(b) Tar spot fungus on maple leaves

(c) Ergots on rye



(a) A satellite image from 2000 shows clear-cut areas in Brazil (brown) surrounded by dense tropical forest (green).



(b) By 2009, much more of this same tropical forest had been cut down.

4 km



**Bilateral symmetry**



**Radial symmetry**

